DOCUMENT RESUME

ED 442 981 CE 080 408

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TITLE Literacy, Electronic Networking, and the Internet. ILI Technical Report.
INSTITUTION International Literacy Inst., Philadelphia, PA.; National Center on Adult Literacy, Philadelphia, PA.
SPONS AGENCY United Nations Educational, Scientific, and Cultural Organization, Paris (France).; Pennsylvania Univ., Philadelphia. Graduate School of Education.; Royal Ministry of Foreign Affairs, Oslo (Norway).
REPORT NO ILI-TR98-10
PUB DATE 1998-09-00
NOTE 12p.
AVAILABLE FROM For full text: http://litserver.literacy.upenn.edu/products/ncal/pdf/TR9810.pdf.
PUB TYPE Reports - Research (143)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adult Education; Adult Educators; *Adult Literacy; Basic Skills; Case Studies; *Computer Networks; *Computer Uses in Education; Cooperative Programs; *Delivery Systems; Developed Nations; Developing Nations; Educational Practices; Educational Technology; Foreign Countries; Futures (of Society); Homeless People; Innovation; *Internet; Linking Agents; *Literacy Education; Postsecondary Education; Professional Development; Teacher Improvement; Technological Advancement; Writing Instruction
IDENTIFIERS *Pennsylvania (Philadelphia)

ABSTRACT

Three Internet-based adult literacy and adult education programs in Philadelphia were examined to identify ways Internet technology can be used to improve adult basic and literacy education. The Adult Literacy Technology Innovation Network (ALTIN) technology program, which began in the mid-1990s, provides basic instructional technology staff development for adult literacy teachers by using a model combining live, hands-on training, online training, and technical assistance and support. The Shelter Communications Literacy Network (SHELCOM), which operated from 1993-1995, was an experimental Internet-based computer writing project for adults living in homeless shelters. Its purpose was to evaluate the effect of file sharing on the quality of compositions written by homeless adult learners. Participants created a publication by working collaboratively through an Internet-based computer network. LiteracyLink, which began in 1996 with funding from the U.S. Department of Education, is designed to serve large numbers of U.S. adults who require basic skills instruction. LiteracyLink includes the following components: an online learning system for adult learners; online assessment of learners' progress; and online assistance to teachers using LiteracyLink materials. All three programs illustrate key principles that can be used to improve literacy education and develop technology-based lifelong learning in both industrialized and developing countries. (MN)

TECHNICAL REPORT

Literacy, Electronic Networking, and the Internet

ILI Technical Report TR98-10
(September 1998)

International Literacy Institute
National Center on Adult Literacy
Graduate School of Education
University of Pennsylvania

INTERNATIONAL LITERACY INSTITUTE

The International Literacy Institute (ILI), officially co-sponsored by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the University of Pennsylvania Graduate School of Education, was formally established in 1994 in Philadelphia. The ILI builds on more than a dozen years of university-based literacy research, the federally funded National Center on Adult Literacy (NCAL), and close collaboration with governmental, non-governmental, and multilateral agencies worldwide. The ILI and NCAL share the same building with the Penn Technology in Education Learning Laboratory (PennTELL) on the campus of the University of Pennsylvania.

The ILI mission is to provide scientific leadership in training and development in literacy, with a special emphasis on developing countries. The ILI defines literacy as primarily the basic skills of reading, writing, and mathematics among children, youth, and adults. The term also includes lifelong and work-related skills.

The ILI has had extensive experience in evaluation and applied research on basic education and literacy in developing countries around the world. The ILI's development activities include partnerships to foster regional and national centers of excellence; training to enhance the capacity of national and regional institutions and agencies; innovations derived from research, development, and evaluation; information dissemination that provides a forum for the exchange of ideas; advanced technologies to increase communication and learning achievement; and training and development activities in both formal school settings and nonformal education programs.

NATIONAL CENTER ON ADULT LITERACY

The National Center on Adult Literacy (NCAL), part of the University of Pennsylvania's Graduate School of Education, was established in 1990 with a major grant from the U.S. Department of Education. Its mission is to enhance the quality of literacy work by pursuing three primary goals: (a) to improve understanding of adult learners and their learning, (b) to foster innovation and increase effectiveness in adult basic education and literacy work, and (c) to expand access to information and build capacity for adult literacy service provision. The Center is currently supported by federal, state, and local agencies as well as private foundations and corporations. NCAL is located, along with the UNESCO-cosponsored International Literacy Institute, in its own building on the Penn campus.

The ILI receives major funding support from a number of agencies and organizations, including UNESCO, the Ministry of Foreign Affairs of Norway, and the University of Pennsylvania. Neither these agencies nor the ILI may be held responsible for the particular views of the individual authors of ILI reports.

LITERACY, ELECTRONIC NETWORKING, AND THE INTERNET

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Abstract

The uses of technology for adult literacy and adult education have been growing exponentially in recent years, from computer-assisted instruction to the information highway and to the simple improvements engendered by the use of personal computers in management and information systems. This paper focuses primarily on electronic networking and the Internet with some current examples from the United States. Various implications and conclusions are drawn for use in literacy work in both industrialized and developing countries.

TABLE OF CONTENTS

INTRODUCTION

The uses of technology for adult literacy and adult education have been growing exponentially in recent years, from computer-assisted instruction to the information highway and to the simple improvements engendered by the use of personal computers in management and information systems. This paper focuses primarily on electronic networking and the Internet with some current examples from the United States. Various implications and conclusions are drawn for use in literacy work in both industrialized and developing countries.

TECHNOLOGY, THE INTERNET, AND ADULT LITERACY

Electronic technologies—computers, wireless communications, videotapes, and the like—are now being incorporated into elementary, secondary, business, and college level education. Adult literacy programs, in contrast, still lag far behind in using these newer technologies for instruction, as several major reports, including a report of the Office of Technology Assessment (U.S. Congress, 1993) and a technology survey by the National Center on Adult Literacy (Hopey et al., 1996; NCAL, 1995) have indicated. Findings from the NCAL technology survey showed that many adult literacy programs have a foothold in technology, but this is mainly in the use of microcomputers for administrative purposes, not instructional ones. Most U.S. programs still do not have the funds to purchase the hardware and software required for instructional or communication purposes. The level of interest in expanding the use of technology, however, appears to be growing rapidly, perhaps more so than anywhere else in the world. For this reason, the case studies described below depend primarily on research undertaken in North America.

Economic considerations clearly are a major impediment to technology implementation in adult literacy programs. The NCAL survey showed that funding topped the list of constraints among U.S. service providers (Hopey et al., 1996). But economics goes even further by inhibiting the development of the market for adult literacy software. The market remains small due to a paradox: Few practitioners purchase adult literacy software because most offerings are of low quality or are inappropriate for use with adults, while software developers are reluctant to invest in product development because the market demand is so small (Harvey-Morgan, 1996). This issue of educationally relevant software likely will be even more important on an international level, where cultural and linguistic options and constraints must be considered.

In the last few years, one dramatic change can be seen in the growing number of adult literacy providers who are using online communications in the United States. Access to online resources and to the Internet has become increasingly easy and relatively low-cost (Hopey & Harvey-Morgan, 1995; Hopey et al., 1996; NCAL, 1995). Bulletin boards and information servers have sprung up, some of which are specially designed to fill the information needs in adult literacy. These technologies hold enormous promise for the future because they can (a) reduce the isolation that many adult literacy providers and students experience, (b) facilitate communication among staff and students within and between programs, (c) increase access to high quality materials and emerging research, (d) streamline administrative and reporting processes, and (e) help to provide the delivery vehicle for innovative instructional and staff development approaches. However, across these new technologies, there is inadequate staff training and a lack of information on effective implementation and specialized uses.

Regardless of financial and staff development considerations, the importance of technology has not been lost on the field of adult learning and literacy in the United States. Those who are technophobic understand the general importance of technology tools, even if they sometimes characterize technology as 'overrated'—a fair claim in many cases. Nonetheless, there are some clear advantages of networking and Internet technology for both adult learners and for adult literacy programs (U.S. Congress, 1993). For learners, this would include (a) reaching learners outside of the classroom, (b) using learning time more efficiently, (c) sustaining motivation, (d) individualizing instruction, and (e) providing access to information tools. For adult literacy programs, this would include (a) improved

recruiting and training of learners, (b) improving curriculum, (c) meeting staff development needs, (d) enhancing assessment and curriculum, and (e) streamlining coordination, management, and administration.

Many of the points raised above are relevant to the consideration of adult learning and technology across many contexts and many countries. In the brief case studies from the United States described below, we provide examples of how the use of Internet technology has progressed over the past five years, and has been implemented with teachers, adult students, and adults learning at home. These cases, each undertaken in Philadelphia, provide some evidential basis for a number conclusions about the future of Internet use for literacy in the coming years.

THREE BRIEF CASE STUDIES

ALTIN: Focus on teachers. The professional development of literacy educators—teachers, tutors, and administrators—is a key component in improving the quality of literacy services for adult learners (Hopey & Harvey-Morgan, 1995; Lytle et al., 1993; NCAL, 1995). Researchers generally agree that the most effective professional development efforts provide intensive experiences over time, enabling practitioners to inquire deeply into critical issues of practice, play leadership roles in their own settings, and create professional communities that connect them to their colleagues and to a fuller range of resources for learning over time.

However, the particularly complex policy and funding issues in the field of adult literacy, which have created a required infrastructure at local, regional, state, and national levels, have made initiating and sustaining high quality professional development a particularly challenging task in the United States. The gradually increasing use of instructional technology and online communications in the field of adult literacy is creating both new opportunities and reviving old challenges. The purpose of the Adult Literacy Technology Innovation Network (ALTIN) technology training program, begun in the mid-1990s, is to provide basic instructional technology staff development for adult literacy teachers, including the basics of instructional technology and electronic online communications in a useful and user-friendly way, while at the same time building a network of practitioners who can, after the six months of training, assist other literacy programs and practitioners by means of a mentoring process (Hopey & Harvey-Morgan, 1995).

The ALTIN model utilizes a combination of live, hands-on training, online training, and technical assistance and support. It consists of 40 hours of live training spread out over a six-month time period, with online training conducted during the intervening weeks. The model relies on occasional technical support being provided between training sessions either via phone or online (Internet). ALTIN is effective because it begins by developing a person-oriented baseline of understanding, relating participants' attitudes and beliefs to their actual experiences with technology. ALTIN has shown that an electronic training network works best when participants have established a "human network" among themselves—when they are able to identify commonalties of interest and need, have established a level of trust and commitment among themselves, and can identify areas of collaboration and communication that will result in mutual benefit. Face-to-face meetings appear to make such "people connections" easier, helping to increase the level of trust, facilitating the identification of areas of mutual interest and concern among participants, and increasing the accountability and commitment that participants have to each other online.

SHELCOM: Focus on learners. SHELCOM—the Shelter Communications Literacy Network—was an experimental Internet-based computer writing project for adults living in homeless shelters (Scheffer, 1996). The project was begun in 1993 and completed in 1995, at the very beginning of the Internet revolution. Its purpose was to evaluate the effectiveness of file-sharing on the writing composition quality of adult learners drawn from among the most disadvantaged communities in Philadelphia. The educational background of learners varied from not having completed high school, to having participated in, but not necessarily completed, a continuing adult education program. Participants worked collaboratively through an Internet-based computer network on creating a publication. Instruction focused on cognitive

strategies within a writing process approach on the computer, and on facilitating the collaboration process between writing partners by means of file-sharing (electronic networking).

SHELCOM received ten Macintosh computers, which were placed in five shelters (two per shelter) for instructional purposes. Shelters were connected with each other through a modem-based communication network based at NCAL. A curriculum was designed for use in the project, which included the following instructional components: (a) learning how to create a well-written composition; (b) learning how to use word-processing for writing; (c) improving typing skills; (d) learning to conduct a simple, structured process of inquiry; and (e) creating a publication of researched stories. SHELCOM instruction focused on writing strategies, such as brainstorming, outlining, drafting, and revising, as well as on investigating topics to acquire the necessary information to create a well-written composition to be included in the learner publication. In addition, participants were instructed in story grammar elements (who, what, why, where, when) as part of the instruction in writing strategies. Instruction occurred through the network. Participants sent their compositions to their writing partner, their teachers, and the project director. Project staff would then provide feedback on the composition to facilitate writing improvement.

As a demonstration project, SHELCOM's main goal was to show how technology could be utilized for educational purposes in some of the most difficult contexts of inner-city America, with populations of adults who were not only poorly educated but also suffering from a variety of problems associated with drug and alcohol use (Scheffer, 1996). In terms of participation and learner retention, SHELCOM showed that such disadvantaged populations can be reached effectively through the Internet, in spite of the initial low literacy abilities of many participants. Participants engaged in regular writing and collaboration activities (facilitated by instructors), and student writing turned from a mechanical process into a creative one with an improved set of writing skills (Scheffer, 1996). File-sharing on the computers facilitated collaboration between participants, and facilitated the provision of instruction from teachers. In sum, adult learners in the SHELCOM program gained insight and understanding on the fluid nature of technology and text, as well as on its speed and reversibility.

LiteracyLink: Distance education for learners and teachers. LiteracyLink, funded by the U.S. Department of Education is designed to serve the large numbers of Americans who require additional basic skills instruction. As an Internet-based lifelong learning system, LiteracyLink has two major goals: (a) to increase the access of adults to learning opportunities that will enable them to obtain their high school diplomas, and (b) to improve the quality of instruction available to individuals and adult literacy providers nationwide through enhanced resources and expanded staff development.

Begun in 1996, LiteracyLink has been organized into three key components: LitLearner, LitHelper, and LitTeacher. LitLearner includes the development of a new online learning system for adult learners, as well as the production and distribution of new video materials, which will be used in the online system. LitLearner is being developed as a series of interactive learning packages for adults seeking a U.S. high school diploma or its equivalent (GED certificate). The learning packages under development are organized around each of the five test areas of the GED. Each package includes three elements: Internet exercises, video lessons, and a modular instructional component of Internet, video, and communication activities. Crucial to the success of LitLearner is a specially designed online software methodology that allows learners and teachers, regardless of ability, to navigate a large instructional resource base. Icon-driven software encourages dynamic access to the widest range of materials on the Internet and within LiteracyLink.

LitHelper, which includes intake and assessment instruments, is designed to provide online assessment that will furnish both learners and educators with accurate and continuous information on learner progress. Components include a brief, initial online intake assessment tool and a more extensive placement tool that guides learners through the video, print, and online instructional materials. In addition, a set of multimedia vignettes are under development that will help students become more comfortable with using LiteracyLink, GED test-taking, and adult learning domains and themes.

The online staff development resource

center is called LitTeacher, which has been developed to assist literacy teachers in their use of LiteracyLink materials. LiteracyLink has created, as of 1998, an electronic community of teachers, a series of online workshops, a collection of websites that have been evaluated for adult learning, and a database of Internet-based lesson plans. This system is designed to provide teachers with specially tailored, online access to a wide assortment of existing literacy resources. LitTeacher is also providing a series of live satellite-based videoconferences (via the U.S. Public Broadcasting Service) that are delivered to an average of 20,000 teachers and administrators annually.

LiteracyLink is currently in development, so that research to better understand the impact of Internet-based technology on adult learning and literacy through distance education has just begun. Four general lines of research are being pursued: (a) What are the differences in literacy skill acquisition between those adult learners who use the online materials and practice exams and those who do not? (b) Does the use of online assessment make a difference in learning literacy skills? (c) What are the differences in the effective use of the online resources by students and by teachers according to particular instructional environments, such as library workstations, the workplace, or classroom instruction? and (4) What is the relationship of online resources and video to learning(i.e., how does the use of video in conjunction with online activities affect learning)?

LiteracyLink is one of the first and most comprehensive initiatives to harness the power of the Internet to provide instruction "on demand" to adult learners, as well as communities, libraries, schools, and homes. Through this initiative, adult learners in the United States will have access to the widest range of relevant quality materials ever made available. Whether and how adult learners can take advantage of this system outside of the United States remains to be explored.

CONCLUSIONS AND FUTURE DIRECTIONS

The above case studies illustrate a few of the opportunities that have become available through Internet technology, such as enhancing staff development, reaching out to the disadvantaged, and taking advantage of the convenience of learning in the home or community. These varied contexts and populations of learners speak to the diverse possibilities that technology is likely to provide in the coming decades.

A number of useful insights stem from research undertaken in these experimental projects. For example, in the ALTIN case study, it was found that human networks are an essential component to the electronic networks that are now easily and cheaply available on the Internet. The SHELCOM project demonstrated that new technologies can be implemented with even the most difficult-to-reach and difficult-to-retain populations, using fairly simple networking and word-processing techniques. LiteracyLink, though still in development, is beginning to show how distance education can provide a cost-effective and comprehensive self-learning system for adult education in the home and community. One should also take note of the incredibly rapid changes in the capability of the technologies as well as in the spread of their use in economically diverse societies like the United States.

Based on such examples, and on what may be learned from other experiences across contexts and technological 'platforms' (the structural base of any particular system), there are, in our opinion, a number of key principles that will need to be followed:

1. *Quality and customer service.* Technology for education will only be useful if it provides a real and timely service, in which the quality and productivity outweigh the costs in time and money. The Internet has grown exponentially around the globe—across and within amazingly diverse societies—precisely because it provides useful tools and information. Educators and policy makers need to stay alert to the need for programs that maintain the principle of providing a positive, useful, and quality service.
2. *Professional development.* New technolo-

gies, while helpful in certain key ways, also create new problems, the foremost of which is training individuals (learners and teachers) how to implement them in a cost-effective manner. Sometimes the training process becomes very expensive, and nearly counterproductive (when in the midst of rapid platform and software changes). The Internet promises, in some respects, to be relatively easy to train on and with. Further, the fact that so many households are using this tool means that there will be a great deal of informal expertise available to support education programs that seek to employ the Internet for instruction. Nonetheless, training will always be required in domains that change rapidly, and the Internet is certainly no exception.

3. *Learning achievement.* Although advanced microcomputer and communications technologies have been available to education programs for nearly 20 years, there remains a dearth of solid information as to their effectiveness on learning achievement. There are good reasons why this is so, not the least of which is that rapid (and even radical) changes in technology often mean that the educational technology program may be no longer in use by the time an evaluation is completed. Nonetheless, it is crucial to try to implement programs with the measurement of learning in mind, and built into the program itself, which is not typically the case in educational technology today.

4. *Technological lifelong learning.* Using online networking technology and the Internet not only provides adult learners with new opportunities for literacy and basic skills instruction but the use of these technologies themselves provide new technological literacy skills that adult learners can utilize in the workplace, for personal reasons, and in the future for additional lifelong learning at higher levels.

In sum, Internet-based network technology is one of the most promising areas for literacy work in the world. The benefits of this technology seem well matched with the following problems in the literacy field: (a) the dispersed and diverse population of adult learners, (b) the limited and thinly distributed expertise in learning diagnosis, and (c) the need to connect learners and instructors interactively in an asynchronous manner that takes advantage of learners' needs for independence along with their unavailability for formal classroom instruction.

The potential of distance education, through electronic networks, is likely to change the nature of learning and literacy work over the next decade. This is because one of the key challenges for the 21st century will be to promote and achieve greater and more current access to information. Only networking technologies, such as the Internet and its successor technologies, has this potential. How disadvantaged groups—whether in industrialized or in developing countries—achieve equity in such a rapidly changing environment will be one of the major challenges to educational planning.

It has been said occasionally that technology is "too expensive" given the particular dearth of funding in literacy work, and in developing countries. The reverse may now be true: literacy work (and basic education more broadly) cannot afford to ignore the tremendous potential of the network technologies and distance education, otherwise that gap between the informationally rich and the informationally poor will continue to grow. ■

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